In the Claims:

Please amend the claims as follows:

1. (Original) A variable optical attenuator comprising

a birefringent element positioned to separate an input optical signal into two spatially separated, orthogonally polarized beams;

a LC modulator positioned to receive the orthogonally polarized beams and selectively alter their polarizations;

a reflective element positioned to reflect the beams back through the LC modulator and the birefringent element, wherein the birefringent element recombines orthogonally polarized components of the reflected beams to produce an output optical signal; and

a controller coupled to the LC modulator to selectively cause the LC modulator to alter the polarizations of the orthogonally polarized beams, wherein during operation the controller is responsive to a request to variably attenuate the intensity of the output optical signal relative to the intensity of the input optical signal to one of multiple non-zero attenuation settings.

2. (Original) The variable optical attenuator of claim 1, further comprising an input port positioned to direct the input optical signal into the birefringent element and an output port positioned to receive the output optical signal from the birefringent element.

3. (Original) The variable optical attenuator of claim 1, wherein the LC modulator includes multiple, independently addressable regions for selectively altering the polarization of an incident beam.

4. (Original) The variable optical attenuator of claim 3, wherein the birefringent element directs a first one of the spatially separated beams to pass through a first one of the addressable regions of the LC modulator and a second one of the spatially separated beams to pass through a second one of the addressable regions of the LC modulator.

5. (Original) The variable optical attenuator of claim 4, wherein the reflective element reflects the first beam to pass back through the first addressable region of the LC modulator and the second beam to pass back through the second addressable region of the LC modulator.

6. (Original) The variable optical attenuator of claim 4, wherein the reflective element reflects the first beam to pass through the second addressable region of the LC modulator and the second beam to pass through the first addressable region of the LC modulator.

7. (Original) The variable optical attenuator of claim 4, wherein the reflective element reflects the first beam to pass through a third addressable region of the LC modulator and the second beam to pass through a fourth addressable region of the LC modulator.

8. (Original) The variable optical attenuator of claim 3, wherein during operation the controller drives the multiple regions of the LC modulator to cause an intensity ratio of the orthogonally polarized components of the output signal to substantially equal an intensity ratio of the orthogonally polarized beams derived from the input signal.

9. (Original) The variable optical attenuator of claim 3, wherein the LC modulator comprises a LC layer sandwiched between a first substrate supporting a ground electrode and a second substrate supporting multiple electrodes corresponding to the multiple, independently addressable regions.

10. (Original) The variable optical attenuator of claim 9, wherein the LC modulator further comprises a fixed retarder layer in series with the LC layer.

11. (Original) The variable optical attenuator of claim 9, wherein the LC layer comprises nematic LCs aligned with respect to an alignment axis in the plane of the LC layer.

12. (Original) The variable optical attenuator of claim 11, wherein the alignment axis is at angle of about 45° to an axis defined by the spatial separation of the orthogonally polarized beams derived from the input beam.

13. (Original) The variable optical attenuator of claim 9, wherein the LC layer comprises twisted nematic LCs.

14. (Amended) The variable optical attenuator of claim 1, further comprising a ~~dichroic~~ polarizer positioned between the LC modulator and the reflective element.

15. (Amended) The variable optical attenuator of claim 14, wherein the ~~dichroic~~ polarizer is a dichroic polarizer positioned to absorb a selected polarization component of the beams for a first pass from the LC modulator to the reflective element and for a second pass from the reflective element back to the LC modulator.

16. (Original) The variable optical attenuator of claim 15, wherein the dichroic polarizer has a dichroic axis aligned either parallel or orthogonal to an axis defined by the spatial separation of the orthogonally polarized beams derived from the input beam.

17. (Original) The variable optical attenuator of claim 1, wherein the reflective element is a mirror oriented to receive the beams at a non-normal angle.

18. (Original) The variable optical attenuator of claim 1, wherein the reflective element is a corner cube retroreflector.

19. (Original) The variable optical attenuator of claim 1, wherein the reflective element is a right-angle prism.

20. (Original) The variable optical attenuator of claim 19, further comprising a retarder element positioned between the LC modulator and the right-angle prism, wherein the retarder

element is configured to offset polarization-dependent phase changes to the beams caused by non-normal reflections from the right-angle prism.

21. (Original) The variable optical attenuator of claim 20, wherein the retarder element is further configured to compensate for a geometric inversion caused by the right-angle prism.

22. (Original) The variable optical attenuator of claim 1, further comprising a LC monitor coupled to the LC modulator and the controller.

23. (Original) The variable optical attenuator of claim 22, wherein the LC monitor comprises a reference light source providing a polarized source beam and which during operation directs the polarized reference beam through an active region of the LC modulator to produce a signal beam, a polarizer positioned to receive the signal beam and produce a polarized signal beam, and a detector for monitoring the intensity of the polarized signal beam.

24. (Original) The variable optical attenuator of claim 23, wherein the reference light source comprises an LED or a laser diode, in series with a film polarizer.

25. (Original) The variable optical attenuator of claim 1, wherein the LC modulator provides a tunable retardance spanning a range of less than 450 nm for a single pass.

26. (Original) The variable optical attenuator of claim 2, further comprising additional input ports each directing an additional input optical signal into the birefringent element and on through the LC modulator and the reflective element, and additional output ports each positioned to receive an additional output optical signal from the birefringent element, wherein each additional output optical signal corresponds to one of the additional input optical signals after it is reflected back through the LC modulator and the birefringent element by the reflective element.

27. (Original) The variable optical attenuator of claim 26, wherein the reflective element is a right-angle prism, and wherein the additional input ports and the additional output ports each extend along an axis substantially parallel to a fold axis defined by the right-angle prism.

28. (Amended) A variable optical attenuator comprising

a birefringent element positioned to separate an input optical signal into two spatially separated, orthogonally polarized beams;

a LC modulator positioned to receive the orthogonally polarized beams and selectively alter their polarizations;

a reflective element positioned to reflect the beams back through the LC modulator and the birefringent element, wherein the birefringent element recombines orthogonally polarized components of the reflected beams to produce an output optical signal; and

a ~~dichroic~~ polarizer between the LC modulator and the reflective element, wherein the polarizer is positioned to contact the beams during at least one of a first pass from the LC modulator to the reflective element and a second pass from the reflective element back to the LC modulator.

29. (Original) The variable optical attenuator of claim 28, wherein the polarizer is positioned to contact the beams during both passes.

30. (Amended) The variable optical attenuator of claim 28, wherein the ~~dichroic~~ polarizer is a dichroic polarizer that has a dichroic axis aligned either parallel or orthogonal to an axis defined by the spatial separation of the orthogonally polarized beams derived from the input beam.

31. (Original) The variable optical attenuator of claim 28, wherein the LC modulator includes multiple, independently addressable regions for selectively altering the polarization of an incident beam.

32. (Original) A variable optical attenuator comprising

a birefringent element positioned to separate an input optical signal into two spatially separated, orthogonally polarized beams;

a LC modulator positioned to receive the orthogonally polarized beams and selectively alter their polarizations; and

a right-angle prism positioned to reflect the beams back through the LC modulator and the birefringent element, wherein the birefringent element recombines orthogonally polarized components of the reflected beams to produce an output optical signal.

33. (Original) The variable optical attenuator of claim 32, further comprising a retarder element positioned between the LC modulator and the right-angle prism, wherein the retarder element is configured to offset polarization-dependent phase changes to the beams caused by non-normal reflections from the right-angle prism.

34. (Original) The variable optical attenuator of claim 33, wherein the retarder element is further configured to compensate for a geometric inversion caused by the right-angle prism.

35. (Original) The variable optical attenuator of claim 32, wherein the LC modulator includes multiple, independently addressable regions for selectively altering the polarization of an incident beam.

36. (Amended) The variable optical attenuator of claim 32, further comprising a dichroic polarizer between the LC modulator and the right-angle prism, wherein the polarizer is positioned to contact the beams during at least one of a first pass from the LC modulator to the right-angle prism and a second pass from the right-angle prism back to the LC modulator.

37. (Original) The variable optical attenuator of claim 32, further comprising an input fiber array positioned to launch the first mentioned input optical signal and additional input optical signals into the birefringent element, and an output fiber array positioned to receive the first mentioned output optical signal and additional output optical signals from the birefringent element.

38. (Original) The variable optical attenuator of claim 37, wherein the input fiber array and the output fiber array each extend along axes substantially parallel to a fold axis defined by the right-angle prism.

39. (Original) The variable optical attenuator of claim 38, wherein the transverse position and orientation of the right-angle prism are selected to optimize the coupling of each output beam to a corresponding fiber of the output fiber array.

40. (Original) The variable optical attenuator of claim 37, wherein the LC modulator includes multiple, independently addressable regions extending along multiple directions for selectively altering the polarization of an incident beam.

41. (Original) A method for variably attenuating an input optical signal to one of multiple non-zero attenuation settings, the method comprising:

separating the input optical signal into two spatially separated, orthogonally polarized beams by directing it through a birefringent element;

selectively altering the polarizations of the orthogonally polarized beams based on a desired attenuation setting by directing the orthogonally polarized beams through a LC modulator; and

reflecting the beams back through the LC modulator and the birefringent element, wherein the birefringent element recombines orthogonally polarized components of the reflected beams to produce an output optical signal.

42. (New) The variable optical attenuator of claim 1, wherein the LC modulator comprises a LC layer sandwiched between a pair of substrates each supporting at least one electrode and a fixed retarder layer in series with the LC layer.

43. (New) The variable optical attenuator of claim 28, wherein the LC modulator comprises a LC layer sandwiched between a pair of substrates each supporting at least one electrode and a fixed retarder layer in series with the LC layer.

44. (New) The variable optical attenuator of claim 32, wherein the LC modulator comprises a LC layer sandwiched between a pair of substrates each supporting at least one electrode and a fixed retarder layer in series with the LC layer.

45. (New) The variable optical attenuator of claim 14, wherein the polarizer is positioned to contact the beams for a first pass from the LC modulator to the reflective element and for a second pass from the reflective element back to the LC modulator.

46. (New) The variable optical attenuator of claim 36, wherein the polarizer is a dichroic polarizer.

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